CS4471

Lab Assignment 6

Spanning Tree Protocol

Group Number: 18

Group Members:

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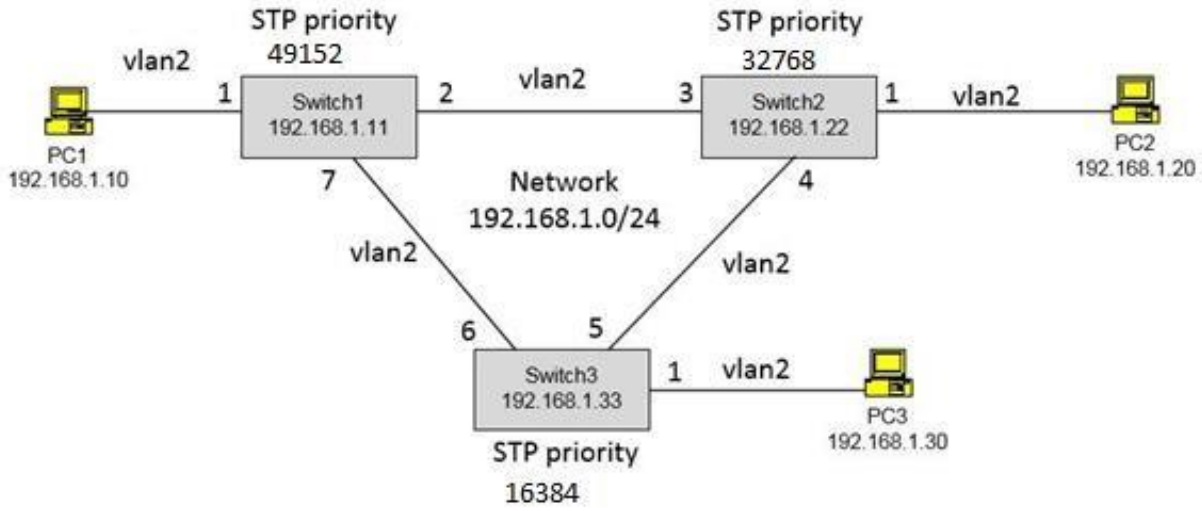
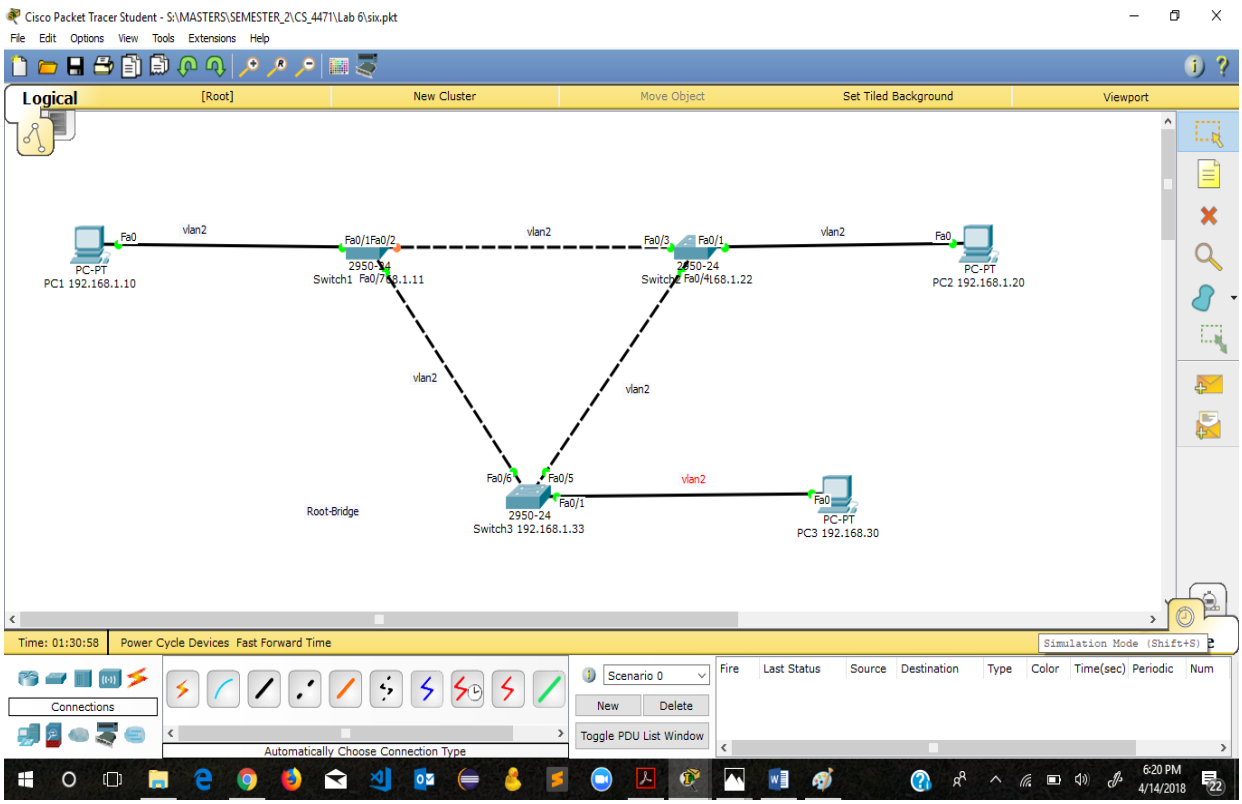
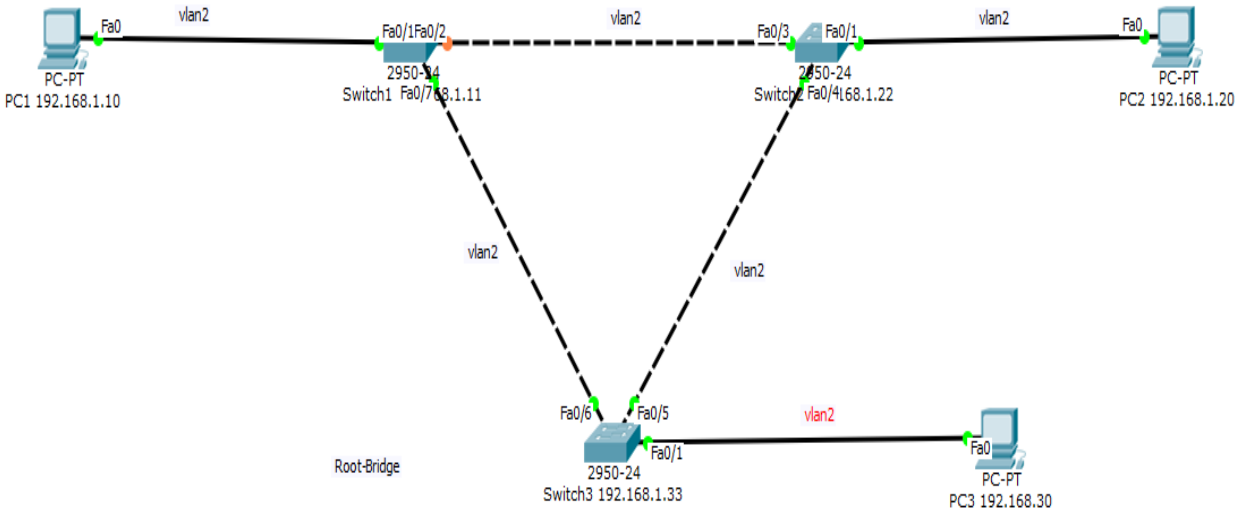
Use Cisco Packet Tracer program to create the network shown below containing 3 interconnected Ethernet switches and 3 computers.

- **configure the hostnames as shown for all six devices**
- **configure each switch port shown to be in vlan 2**
- **configure IP address and subnet mask of all six devices as shown**
- **interconnect the six devices with appropriate Ethernet cables and verify that all six links are up**
- **verify that from PC1, you can ping the IP address of the other five devices**
- **configure spanning-tree priority of each switch with values shown.**



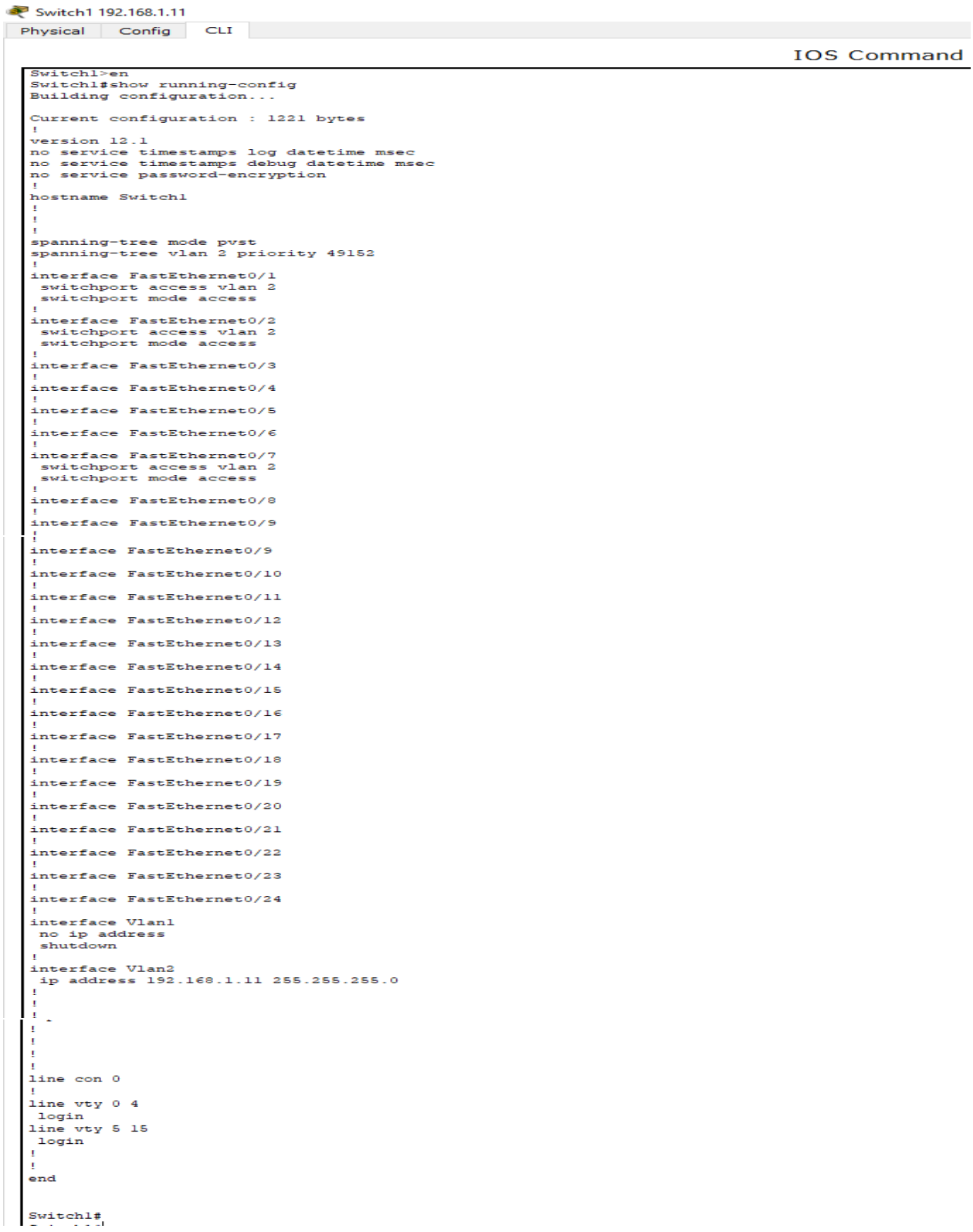
1. **(20 pts) submit screenshot of Cisco Packet Tracer network diagram created. Make sure that the port labels are shown (Options->Preferences->Show Port Labels)**





2. **(30 pts) submit printout of output of "show running-config" of each switch**

Switch1:



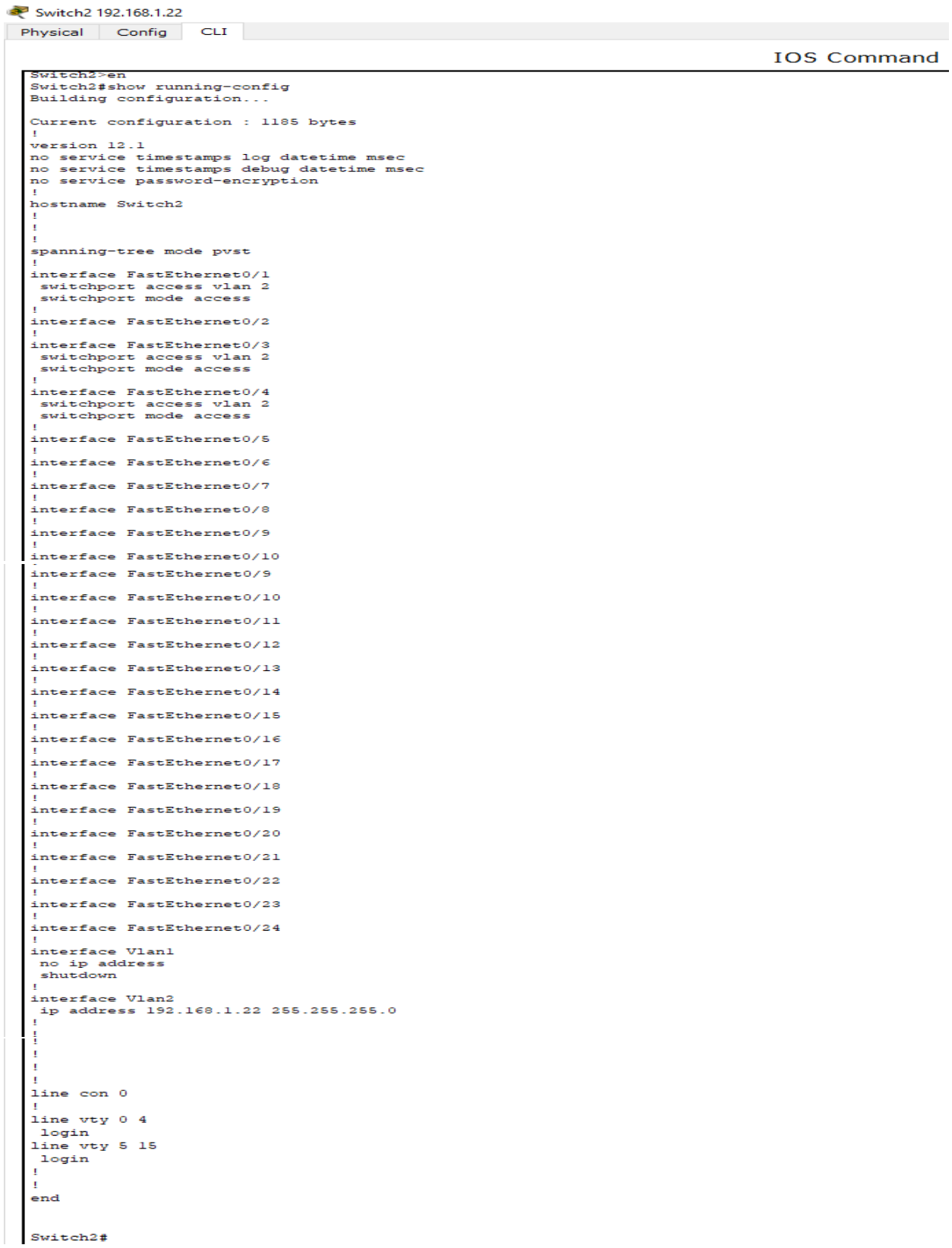
Switch1 192.168.1.11

Physical | Config | CLI

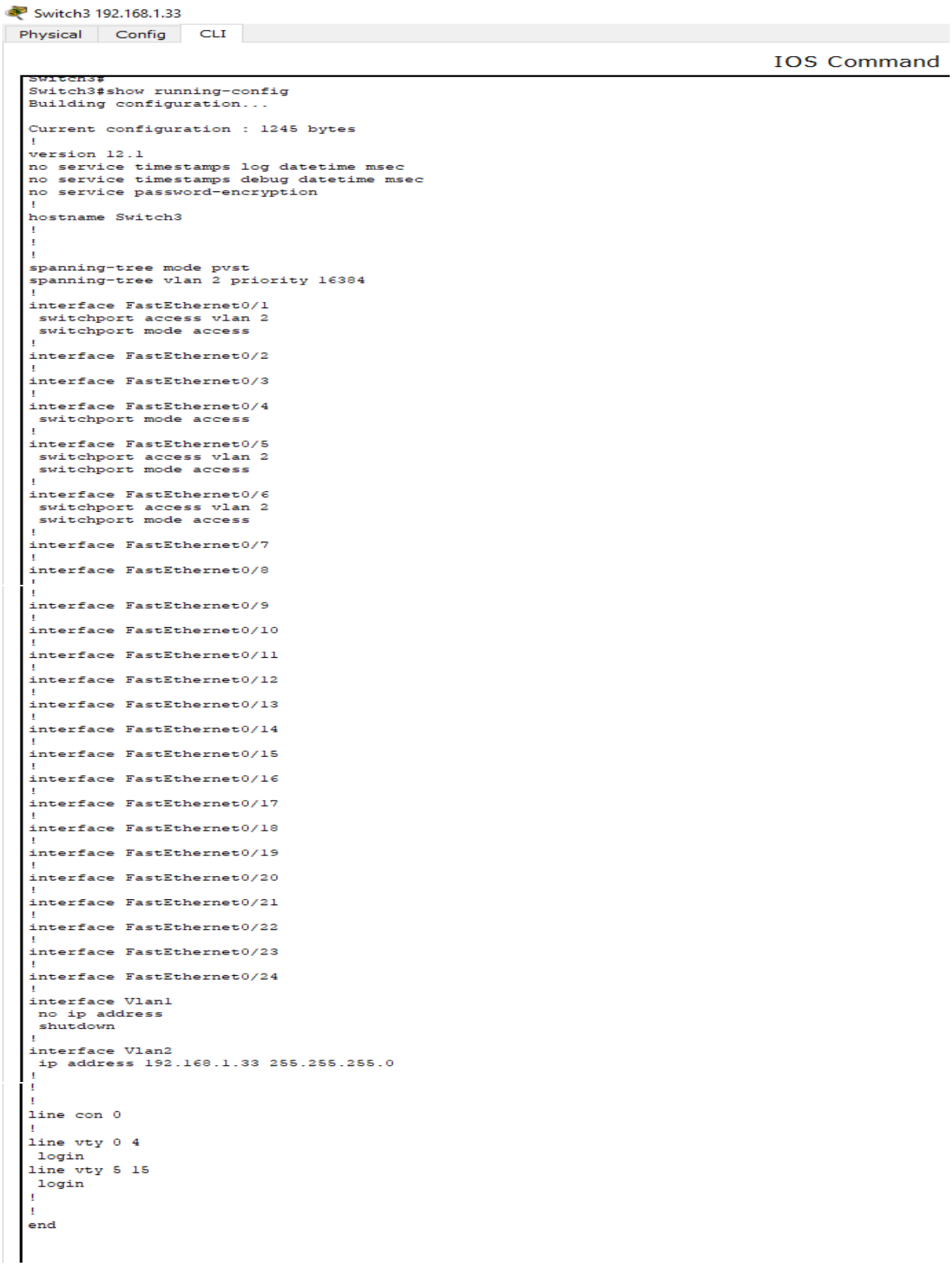
IOS Command

```
Switch1>en
Switch1#show running-config
Building configuration...

Current configuration : 1221 bytes
!
version 12.1
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname Switch1
!
!
!
spanning-tree mode pvst
spanning-tree vlan 2 priority 49152
!
interface FastEthernet0/1
 switchport access vlan 2
 switchport mode access
!
interface FastEthernet0/2
 switchport access vlan 2
 switchport mode access
!
interface FastEthernet0/3
!
interface FastEthernet0/4
!
interface FastEthernet0/5
!
interface FastEthernet0/6
!
interface FastEthernet0/7
 switchport access vlan 2
 switchport mode access
!
interface FastEthernet0/8
!
interface FastEthernet0/9
!
interface FastEthernet0/9
!
interface FastEthernet0/10
!
interface FastEthernet0/11
!
interface FastEthernet0/12
!
interface FastEthernet0/13
!
interface FastEthernet0/14
!
interface FastEthernet0/15
!
interface FastEthernet0/16
!
interface FastEthernet0/17
!
interface FastEthernet0/18
!
interface FastEthernet0/19
!
interface FastEthernet0/20
!
interface FastEthernet0/21
!
interface FastEthernet0/22
!
interface FastEthernet0/23
!
interface FastEthernet0/24
!
interface Vlan1
 no ip address
 shutdown
!
interface Vlan2
 ip address 192.168.1.11 255.255.255.0
!
!
!
!
!
!
!
line con 0
!
line vty 0 4
 login
line vty 5 15
 login
!
!
end


Switch1#
```

Switch2:


Switch2 192.168.1.22
Physical
Config
CLI
IOS Command
Switch2>en
Switch2#show running-config
Building configuration...
Current configuration : 1185 bytes
!
version 12.1
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname Switch2
!
!
!
spanning-tree mode pvst
!
interface FastEthernet0/1
switchport access vlan 2
switchport mode access
!
interface FastEthernet0/2
!
interface FastEthernet0/3
switchport access vlan 2
switchport mode access
!
interface FastEthernet0/4
switchport access vlan 2
switchport mode access
!
interface FastEthernet0/5
!
interface FastEthernet0/6
!
interface FastEthernet0/7
!
interface FastEthernet0/8
!
interface FastEthernet0/9
!
interface FastEthernet0/10
interface FastEthernet0/9
!
interface FastEthernet0/10
!
interface FastEthernet0/11
!
interface FastEthernet0/12
!
interface FastEthernet0/13
!
interface FastEthernet0/14
!
interface FastEthernet0/15
!
interface FastEthernet0/16
!
interface FastEthernet0/17
!
interface FastEthernet0/18
!
interface FastEthernet0/19
!
interface FastEthernet0/20
!
interface FastEthernet0/21
!
interface FastEthernet0/22
!
interface FastEthernet0/23
!
interface FastEthernet0/24
!
interface Vlan1
no ip address
shutdown
!
interface Vlan2
ip address 192.168.1.22 255.255.255.0
!
!
!
!
!
line con 0
!
line vty 0 4
login
line vty 5 15
login
!
!
end
Switch2#

Switch3:


Switch3 192.168.1.33
Physical
Config
CLI
IOS Command
Switch3#
Switch3#show running-config
Building configuration...
Current configuration : 1245 bytes
!
version 12.1
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname Switch3
!
!
!
spanning-tree mode pvst
spanning-tree vlan 2 priority 16384
!
interface FastEthernet0/1
 switchport access vlan 2
 switchport mode access
!
interface FastEthernet0/2
!
interface FastEthernet0/3
!
interface FastEthernet0/4
 switchport mode access
!
interface FastEthernet0/5
 switchport access vlan 2
 switchport mode access
!
interface FastEthernet0/6
 switchport access vlan 2
 switchport mode access
!
interface FastEthernet0/7
!
interface FastEthernet0/8
!
!
interface FastEthernet0/9
!
interface FastEthernet0/10
!
interface FastEthernet0/11
!
interface FastEthernet0/12
!
interface FastEthernet0/13
!
interface FastEthernet0/14
!
interface FastEthernet0/15
!
interface FastEthernet0/16
!
interface FastEthernet0/17
!
interface FastEthernet0/18
!
interface FastEthernet0/19
!
interface FastEthernet0/20
!
interface FastEthernet0/21
!
interface FastEthernet0/22
!
interface FastEthernet0/23
!
interface FastEthernet0/24
!
interface Vlan1
 no ip address
 shutdown
!
interface Vlan2
 ip address 192.168.1.33 255.255.255.0
!
!
!
line con 0
!
line vty 0 4
 login
line vty 5 15
 login
!
!
end

3. **(50 pts)**

a. **which switch is the root bridge and which switch ports will become a Spanning-Tree Protocol root port?**
Ans:

Root Bridge: Switch3

Spanning-Tree Protocol Root Port: Switch1 → Fa0/7

Switch2 → Fa0/4

```
ena


Switch3#
Switch3#sh spanning-tree
VLAN0002
  Spanning tree enabled protocol ieee
  Root ID     Priority    16386
              Address     0001.638E.7E52
              This bridge is the root
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID   Priority    16386  (priority 16384 sys-id-ext 2)
              Address     0001.638E.7E52
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
              Aging Time  20

Interface        Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- -------- --------------------------------
Fa0/6            Desg FWD 19        128.6    P2p
Fa0/5            Desg FWD 19        128.5    P2p
Fa0/1            Desg FWD 19        128.1    P2p

Switch3#
```

b. **which switch port(s) will Spanning-Tree Protocol place into forwarding state?**

Ans: Switch3: Fa0/6 & Fa0/5
Switch2: Fa0/3

```
Switch2#
Switch2#sh spanning-tree
VLAN0002
  Spanning tree enabled protocol ieee
  Root ID     Priority    16386
              Address     0001.638E.7E52
              Cost        19
              Port        4(FastEthernet0/4)
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID   Priority    32770  (priority 32768 sys-id-ext 2)
              Address     0010.1124.946E
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
              Aging Time  20

Interface        Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- -------- --------------------------------
Fa0/3            Desg FWD 19        128.3    P2p
Fa0/4            Root FWD 19        128.4    P2p
Fa0/1            Desg FWD 19        128.1    P2p

Switch2#
```

c. **which switch ports(s) will Spanning-Tree Protocol place into blocking state?**

Ans: Switch1: Fa0/2

```
Switch1#
Switch1#show spanning_tree
                    ^
% Invalid input detected at '^' marker.

Switch1#sh spanning-tree
VLAN0002
  Spanning tree enabled protocol ieee
  Root ID     Priority    16386
              Address     0001.638E.7E52
              Cost        19
              Port        7(FastEthernet0/7)
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID   Priority    49154  (priority 49152 sys-id-ext 2)
              Address     0001.63BD.C693
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
              Aging Time  20

Interface        Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- -------- --------------------------------
Fa0/2            Altn BLK 19        128.2    P2p
Fa0/7            Root FWD 19        128.7    P2p
Fa0/1            Desg FWD 19        128.1    P2p

Switch1#
Switch1#
```

d. **If PC1 were to send ICMP ping packets to PC2, which network links will the packets traverse?**

Ans:

Network Link for packet Traverse

PC1 → Switch1 → Switch3 → Switch2 → PC2

e. **what will happen to the port originally in STP blocking state when a STP root port is administratively shutdown?**

Ans: When Root Port administratively shut down fall in the category of Disabled State. When a Port is enabled it will start in Blocking State to prevent any loops and thus no forwarding of traffic will take place neither the port will learn any MAC addresses. A Blocked Port will only process received BPDUs from neighboring switches.